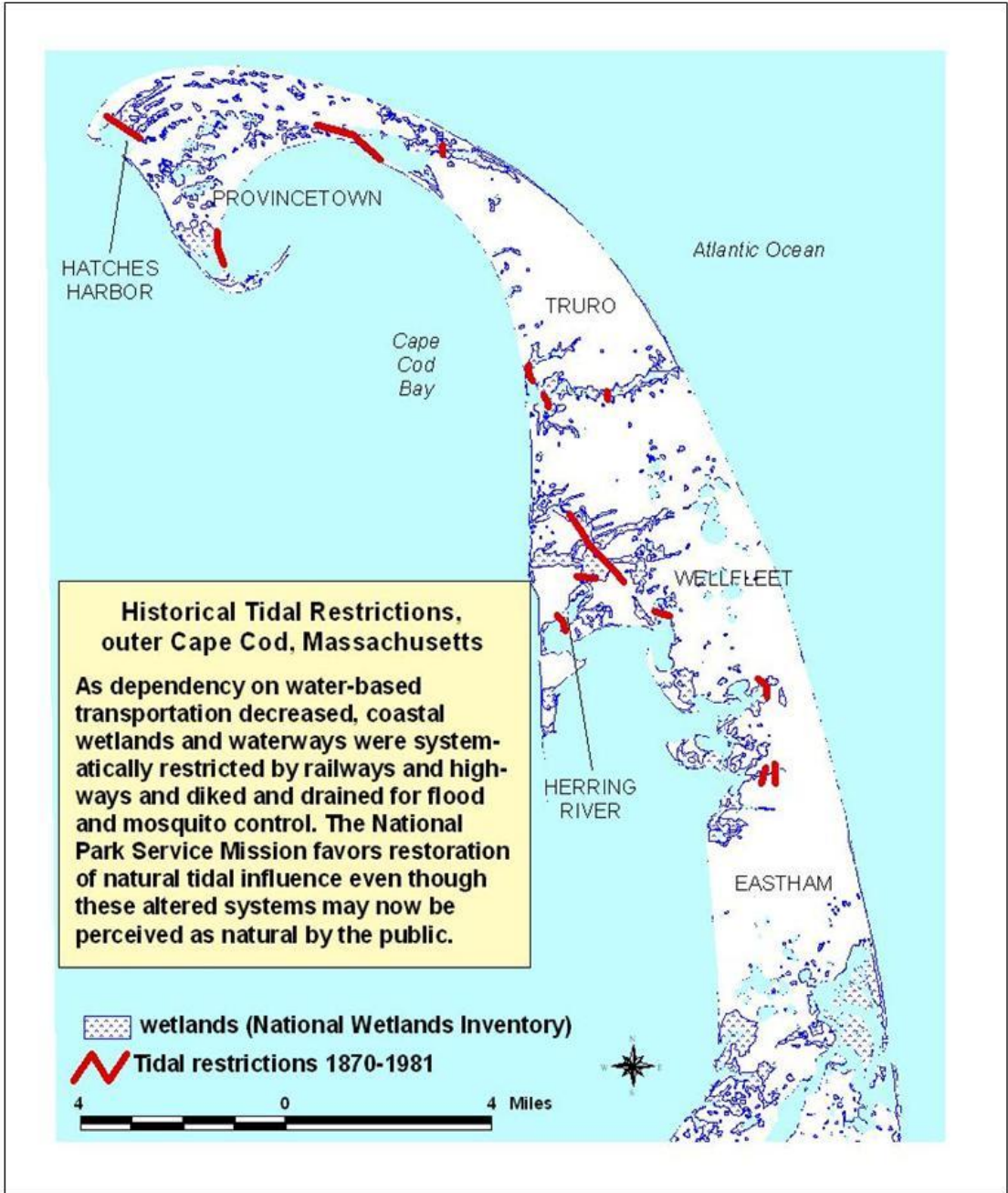


# Restoration of Historically Restricted Estuaries, Cape Cod National Seashore, Massachusetts.

The benefits of naturally functioning tidal salt marshes can be enjoyed by present generations of National Seashore users through carefully phased restoration programs including assessment, modeling, restoration and monitoring. Estuaries on Cape Cod in various stages of restoration include Hatches Harbor (Provincetown), East Harbor (Truro) and Herring River (Wellfleet). Steps have included topographic mapping with survey-grade GPS, vegetation and water quality inventories, predictive hydrologic modeling, community consultation and scientific oversight, reconstruction of tidal culverts and staged re-introduction of tidal influence. Post-restoration monitoring is underway at Hatches Harbor and East Harbor and pre-restoration assessment at Herring River.

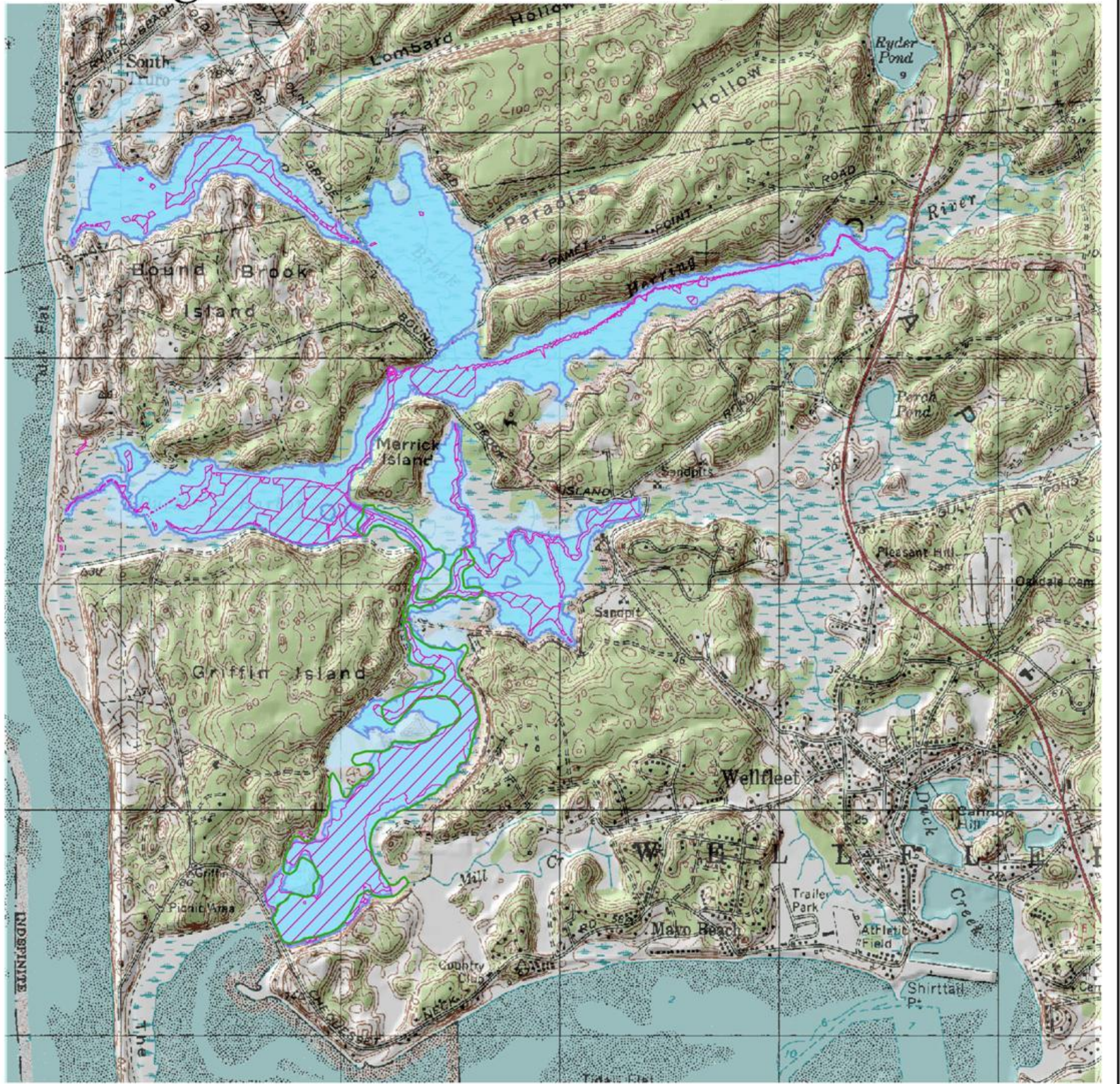


Herring River dike and culvert (looking north).

Hatches Harbor salt marsh and dike (looking south).

Cape Cod National Seashore Massachusetts National Park Service U.S. Department of the Interior

## Herring River Tidal Restoration, Wellfleet MA



Tidal restrictions to the Herring River system have resulted in diminished and degraded estuarine habitat (subsidence, acidification oxygen depletion and encroachment by upland shrub/forest vegetation). Increased tidal action could be achieved by opening tidal gates at the dike and should improve water quality, reduce fish kills, expand mosquito predators and restore salt marsh productivity to large areas of the historic flood plain.

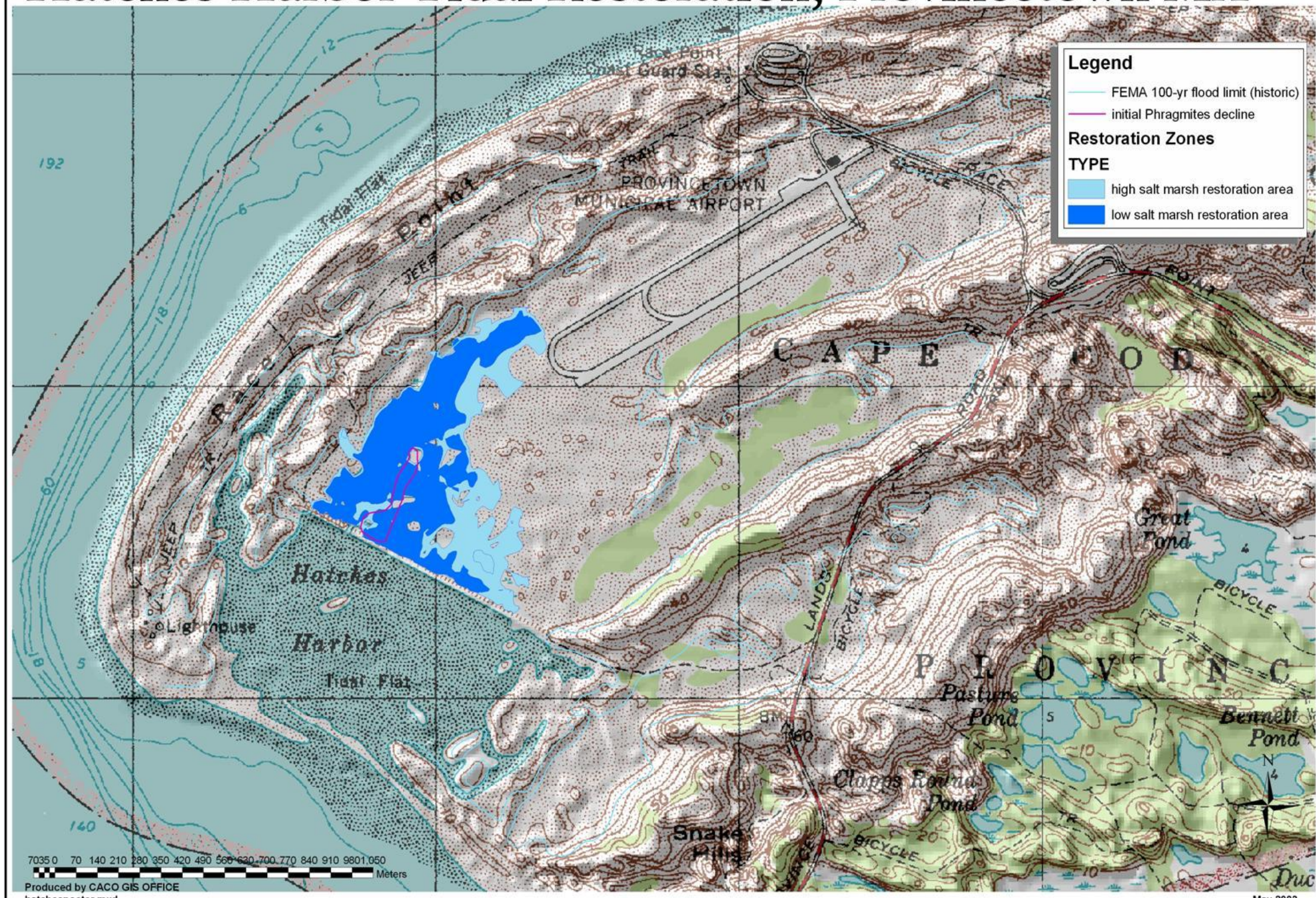
Tidal Restoration Scenarios Areas of Influence (from hydrodynamic model).

- one gate open - mean high tide
- three gates open - mean high tide
- three gates open - 100 year storm

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## Hatches Harbor Tidal Restoration, Provincetown MA



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